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A MONTHLY
DEVOTED
TO THE
PRACTICAL
APPLICATION
OF THE
NEW SCIENCE
AND TO THE
PHYSICAL
IMPROVEMENT
OF MAN.

HEBER ROBERTS M.D., M.E. EDITOR.
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DR. J. RUDIS-JICINSKY, CEDAR RAPIDS, IOWA.
Member and Secretary of the Roentgen Society of the United States.

The American X-Ray Journal.

Devoted to Practical X-Ray Work and Allied Arts and Sciences.

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THE FIRST ANNUAL MEETING OF THE ROENTGEN SOCIETY.

The first annual meeting of the Roentgen Society of the United States was held in the Library and Club rooms of the Grand Central Palace, New York City, December 13th and 14th. Important papers and a full report of the transactions will be published. The stenographer's report is not made up in time for this number of the JOURNAL.

When the full import and achievement of this meeting is judged from the lapse of a little time there must develop among thousands of physicians, surgeons, and others interested in x ray work a deep sense of regret that they missed the greatest educational opportunity of four years. Without any doubt there was exhibited in the 2,600 square feet of space devoted to apparatus the finest collection of x-ray appliances yet brought together anywhere in the world. The immense value of comparison as an educational factor was here apparent. Side by side were seen competing instruments of the most varied types and construction. The strides that had been taken in mechanical improvements were visible on every hand. Two hours in this room was worth more to the incipient x ray operator in search of information than two years of price list study.

The high degree of efficiency to which

current generators, coils, static machines tubes, regulating, and other devices, have now been brought was impressed upon all visitors. The impression of the apparatus room was universally one of surprise at its comprehensiveness and quality. It would have well repaid five thousand physicians and x-ray amateurs to have compared notes in a single circuit of this room. In this issue lack of space prevents more detailed mention of features that should have been seen to be appreciated.

The literary program of the meeting contained twenty five papers. The educational possibilities of such a program and full discussion by experts can hardly be grasped by one not present at the meeting. The necessary business connected with completing the permanent organization of the society unavoidably lessened the limits of discussion and entrenched somewhat upon time allotted to papers, but the feast of good things whetted every appetite for more. Before the first session had closed it was realized that the organized action of an organized scientific body to regulate details and determine standards essential to accurate x-ray work was the imperative need of the hour.

Among new committees appointed to take charge of fundamental work may be named the following:

Committee on Standards.

Committee on Medico-legal Status.

25,000 Subscribers is our aim for 1901.

Committee on Scientific Research.

Committee on X-Ray Therapeutic Investigation.

Committee on Revision of the Constitution.

Officers elected were:

Dr. Heber Roberts, St. Louis, Mo., President.

Dr. J. P. Girdwood, Montreal, Cana., Vice-President.

D. H. P. Bender, Brooklyn, N. Y.

Dr. J. Rudis-Jicinsky, Cedar Rapids, Iowa, Secretary.

W. A. Price, D. D. S. Cleveland, Ohio Assistant Secretary.

Dr. E. A. Florentine, Saginaw, Mich., Treasurer.

Trustees.—R. Jm. J. Beard, Frinta, Calo.

Mr. W. C. Andrews, Schenectady, N. Y.

Lewis C. Cuter D. D. S. Dayton, Ohio.

The place of the next meeting was discussed and an invitation from the Mayor of Buffalo was read. The selection of place was left to the decision of the officers of the society. As the meeting closed the most dominant feeling among those who attended was a recognition of the revealed usefulness of the Roentgen Society and the importance of directing it so as to reap the best fruits of united and high minded effort.

PRESIDENT'S ADDRESS.

DR. HEBER ROBERTS.

Delivered before the First Annual Meeting of the Roentgen Society of the United States, Grand Central Palace, New York City, Dec. 3, 1900.

Early in 1896 Professor Monell, of New York City, proposed to some local associates a plan for the organization of a society devoted to this new science of x-rays. He found poor encouragement and no meeting was held. This proposition of his was made before any organization to this end was effected anywhere in any country. Before the end of another year many societies had been formed, for local mutual ad-

vantage, both in Europe and America. It was in this year that I seemed to please myself more following the dim lights of Roentgen, than to pursue my more remunerative accustomed duties. Then came the parent journal of the world which was launched in the first week in May, 1897. In starting the AMERICAN X-RAY JOURNAL I did not consult anyone about the propriety or wisdom of my course. If I had it would have been swallowed up by the historic monster of disapproval. At that time there seemed to come a dearth or spell over the Roentgen world. The lay press had already ceased to print sensational matter about the x-rays, and medical journals were not certain that the profession could read skiagraphs. But this body of thinking men before me is a powerful reminder that I was not alone in hope; the under silent tide was the thinking mind. What has been done to urge on this intellectual and human growth has been done by you. Every individual effort to acquire knowledge has added to the store-house from which we here hope to be generally benefitted. He who has done only a little in this line has done much to correct uncertain diagnosis and better the condition of man; but with the crystalization in each one of us, of the work of all of these investigators, what vast influence for good each one of us may be. These silent workers have responded to a call more human than any other purpose for which man can meet. To know whereof one is sick; to recognize the cause of disease, is the first of all knowledge. To ignore this is to ignore the foundation.

In January of this year, Dr. J. Rudis-Jicinsky, of Cedar Rapids, wrote to me for an expression about forming a Roentgen Society. At my request he wrote to forty physicians with similar inquiry. The answers were against the individual organization. Ex-Presidents of the American Medical Association and others therein in-

This is the Official Organ of the

erested modestly suggested its feasibility, provided it was agreeable to the great parent. Its existence was deemed only possible when it was accepted by and made contributory to their great associations. A few however agreed that a society was timely. There were three overshadowing reasons any one of which was enough for individual action. First, the x-ray was the greatest and most certain diagnostic assistant ever offered the profession, but required technical knowledge to properly operate, the discussion of which would be impracticable in another medical body. Secondly, the x-ray has remedial properties, in the line of diseases ignored as curable by the profession of medicine, and should not in discussion be hampered by unnecessary prejudices. Thirdly, since the x-rays contemplate radiant matter we need the assistance of physicists in our meetings, which could not be, as members of the American Medical Association. We decided therefore to call a meeting which convened in my office in St. Louis, February of this year. Here all preliminary arrangements were made. This gentlemen, is the fruit of that meeting and is the first regular meeting of the Roentgen Society of the United States, the first meeting of a national character for the purpose of advancing the interest of the Roentgen discovery.

William Conrad Roentgen was born in Lennep, a small town near Duesseldorf in Rhenish-Prussia, March 27th, 1845. (Duesseldorf is the native town of the greatest musical genius, Beethoven). He pursued his studies at Zuerich, Switzerland, under Kundt, and graduated in 1869. With his instructor he went to Wuerzburg in 1870 as his assistant. In 1872 he went to Strassburg, where he became a lecturer in 1874 at the Academy at Hohenheim, and soon after became adjunct professor at the University of Strassburg. In 1879 he was made ordinary professor (full professor) of physics at

the University of Giessen, and in 1888 professor of physics of the University of Wuerzburg. It was in the physical laboratory of this University that he made his discovery, November 1895. He was knighted by the King of Bavaria, and his name is therefore von Roentgen, but his modest ways ignored the title. The German Emperor asked him to call at Berlin, where he explained the discovery to him. The Government then voted him a pension, but Roentgen declined to accept any money. On account of the extreme modesty of this man he was thought to not be mentally equal to his associates. Since his discovery these same men adore him as a genius. Roentgen is the highest type of the great, modest German professors. He is at present professor of physics in the University of Munich.

I know you will share with me the pleasure of this bit of history since so many errors have crept into all accounts of Professor Roentgen. These facts have been related to me by Dr. Carl Beck, of this city, a close friend and pupil of this great man.

In the beginning of January, 1896, the ordinary apparatus employed for x-ray uses would only blacken the photographic plate through the bones of the hand after thirty minutes exposure. Now ten seconds exposure will give a good picture of the entire body. At that time we could not do fluoroscopic work at all. Now we can locate the various organs of the body, and in addition to locating dense objects and fractures anywhere, we can determine some pathological changes before they can be detected by any other known means. This last saying seems absurd to the "owls of old ways," who know nothing of the technique of good raying. Many of these sages of maturity have used the x-rays and formed conclusions without study and without instruction and without adequate apparatus. It is well known that incipient phthisis

may be present and yet free from any physical signs known to percussion or to auscultation. The x-ray will make clear the nature of this disease to the Roentgen pathologist. Signs of pleuritic effusions can not give us exact information, but the x-rays can. Abscess of the brain, when the symptoms are masked cannot be located by any known outward signs. The x rays will locate it with precision. Aneurism in early stage before physical signs are apparent are unmistakable with the x-rays. A better understanding of internal growths in any portion of the body is obtained with the x-rays. We know now when and which kidney to cut for stone. In the fluoroscopic study of the heart much has been done, especially in detecting dilatation and atheromatous changes. In appendicular abscess, hematoceles, pregnancy and other diagnostic requirements the x-rays have a place. Bone and joint surgery have always commanded the best talent, but have always been masked with uncertainty. The x-rays clear up all doubt. We no more have to grope with the germ carrying probe, for now we can come mathematically upon the smallest missile anywhere in the human frame. Some surgeons having acquired their alleged x ray knowledge by instinct, have cut elsewhere than upon the bullet, and then written learnedly of the "uncertainties of the x-rays." We now do more than simply accurately locate foreign matter. We show by raving the relation of parts occasioned by structural changes, and the nature of the change. For instance, we can distinguish coxa vara by position and cares from necrosis.

The therapeutic advantage of the x-rays is prominent mostly because it contemplates the cure of those diseases known by the profession as practically incurable. In eczema, of syphilitic cause, x-rays will not cure but medicines will. The greatest number of eczema are not permanently

curable with medicines but every case so far treated with the x-rays have yielded permanently. Lupus has baffled the world of thought and application in search of a remedy and it is only from some obscure place we ever read of a cure. With the x-rays failures are not known and the cures are effected without giving pain or leaving scars. Early consumptives improve with raying.

Scar tissue disappears under the influence of the x-rays. Inflamed tissues improve while raying. The analgesic effect is pronounced, as observed by all operators. Inflammation can be set up by the x-rays, when the light has been prolonged with energy sufficient to produce a trophoneurotic change. We are not certain that the rays have bactericidal properties. The cures effected may be due to the greater potency in phagocytes—a change brought about in the granular realm and blood ratio.

After all this glorious record sufficient for a hundred years, moving on we see the necessity for standardizing some method for accurate diagnosis and therapy. Our language should express what it means and the picture whether on plate or screen, should have an intelligent interpretation. We realize this must be done before we can be said to have a science acceptable to the thinking people and especially to the courts. I propose that we standardize diagnosis first and then fix an approved therapy for the x-rays. By standardizing methods for x-ray diagnosis I mean there should be a way or fixed rule for taking x-ray pictures, which shall be approved by this society. The method shall accurately skiagraph a fixed land-mark in all instances. So far as my conceptions go I cannot conceive of a first-class x-ray diagnostician who does not possess a fair knowledge of anatomy and pathology, on the one side, and technical training of the use of the apparatus and of the skiagraphic

reading on the other. However, in some instances accurate work may be done by some who do not possess the first essentials. In skiagraphic work the subject must be immobilized, but it is not necessary that the patient should lie down in all instances. If it is the chest or upper extremities to be skiagraphed, the patient may sit erect with the proper supports. In all cases some definite pre-determined land-mark should be taken, either artificially made or taken from some well known promitory. If the chest is to be examined it may be for a broken bone, pleuritic effusion, consumptive area, a bullet, but it matters not what. Our duty is to first settle upon the object with fluoroscope and then determine a line—fix a line as nearly as possible at right angles to the body through the object sought. This can be done with any convenient ray-absorbent right angle device. The anode is placed with some care in a position, that it can, without trouble be shifted, so that the object sought for in the chest falls within the arms of the ray-absorbent. If necessary, sights may be used and marks made on the skin. To obtain perfect position the same maneuvering should be done transversely or at right angles to the first. The essential of all examinations and skiagraphy, is to know at what two points the rays are passing in a direct line through the body or organ. This must be known in order to be able to judge intelligently of the distortion by position. If in a skiagraph we can point to a particular place in which there is no distortion save the axis with equal radii, then all other points about have a measurable angle. This particular place is the land mark and may represent the ray-absorbent, or the object sought, at the caprice of the operator. When in possession of these rudiments, and when the distance from the object to the plate is known, and that from the anode to the plate is also known, then it is

not a difficult matter to interpret a skiagram. In reading we must have a starting point and begin free from error. If we are to skiagraph the hip, the position of the anode should be over the angle formed by the lines intersecting, one drawn transversely across the pubes and the other falling to the first from the anterior superior spinous process. Ray-absorbent must be used if ocular proof of a skiagraph is called for. In courts of law the object sought in a photograph must be unimpeachable. This can be obtained and is simplicity in skiagraphy. If it is desirable to take both hips in one picture by the x rays, a plumb line may be suspended from the anode from a frame provided for the purpose. The plate is first put in position and the plumb dropped to a bit of ray-absorbent affixed to the covering of the plate. The subject is now so adjusted over the plate that the plumb suspended, will point to the median line at the superior border of the symphysis. Here another ray-absorbent is fixed. In the skiagram we have but a single land-mark, and when the thickness of the subject is known, all portions of the plate are interpreted. If the picture is of an adult male (sex and age differ in a picture) with toes up, the great trochanter is most favorably shown, and also the neck of the femur in its normal length. If the tube is 18 inches from the plate, and the neck 3 inches from the plate, there will be a shadow of the neck magnified about 1-6 greater than the normal. But the shape and position is nearly correct and the angle to the shaft is about 125 degrees. Everting the foot elongates the neck, inverting the foot shortens the neck. The angle of the neck is increased by placing the tube above the symphysis but the neck is shortened, and by receding more a point is reached where the head and neck appear as one. If placed below the symphysis the tuberosity and head may be made to appear as one,

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and the neck have the false position of right angle to the shaft.

The therapy of the x-rays have their selective action similar to the therapy of drugs. There are cases of idiosyncrasies, probably, as there are in drugs. I am not sure that this is true. A tube that will show the bones of the hand five feet away is good enough for therapeutic effect for all treatment of the skin. The part to be treated is exposed and all other parts are covered one-half inch thick with cloth, and over this tin. The tube, ten inches from the surface, should emit rays without any or at least very little electrostatic effect. The patient laying on the table may be somewhat charged but always with impunity. No sparking or sensation is felt. The coil and static machine will do the work equally well. Reaction may be looked for after the twelfth treatment, and bronzing is the first symptom. The duration of the treatments, which were twelve minutes each daily, are now reduced to eight minutes, alternating days. In the case of hair removal, the sixteenth treatment will cause them to whiten and begin to fall. About the twenty-sixth treatment the skin scales and a crusty sensation indicates needed cessation of the rays. After a week, there being no pain nor sensation renew the treatments five to ten times. In lupus vulgaris some inflammatory reaction is needed. Loss of time during these treatments does not impair the good effect the raying has already done. After having weighed the case, as to the nature of the disease, the point to establish is to fix the degree of radiance; and acting with a standardized tube and from a standardized method, any operator with a fair amount of judgment may become an x-ray therapist.

But we must be educated in the technique of this profession. This society should be in touch with every accredited x-ray therapist and diagnostician in the

States, and also know those who are in competent.

I have reflected herein some of the hope of the future and glanced retrospectively probably occupying too much of the time that more properly belong to the discussion of the many valuable papers before us. But I felt a little enthusiastic as your first president and doubly urged on by this magnificent display and attendance.

X-RAY IN LUPUS VULGARIS.

BY DR. JOS. HOFFMANN, VIENNA AUSTRIA.

Written for and Read at the First Annual Meeting of the Roentgen Society of the United States.

[Translated by Dr. J. Radis-Jicinsky.]

Upon the use of the Koentgen rays in the treatment of lupus vulgaris we have favorable reports from many sources: Schiff, Kummert, Holland, Rieder, Gocht, Lovt, Geroud, Fiorenti, Luraschi, Ravillet, Musham, Jones, Rudis-Jicinsky, Knox, Albers and Schoenberg. We know that the powerful x-ray has an influence upon tissue, and that in the application of the same in cases of lupus we have the best means for producing irritation for an artificial inflammation and conversion of unhealthy ulceration into open and healthy granulation.

The x-rays are irritant in their action, this being due to the violet rays in them. This irritation effects not only the skin, but goes up to the point of penetration, to subcutaneous tissues also. They may produce changes in the epidermis or its appendages, or act upon the deeper tissues. These changes are all of inflammatory reaction, varying from slight erythema through all the degrees of dermatitis up to necrobiosis. We are now able to demonstrate that these conditions are due to the electrochemic action of the rays, and are not a "burn" when properly applied and this electrochemic irritation controlled, the x-ray becomes of great value in the restoration of parts to health,

We reach more reading people

especially those that have suffered, as in lupus vulgaris from bacteria. For these cases we are after the bacillus tuberculosis, the causative agent of lupus. The irritant bring to the diseased tissues an increased blood-supply, so that they may resist the attacks of the germs, which finally are expelled or destroyed.

I have investigated the action of the x-rays on both healthy and diseased skin, and came to the following conclusions:

The mild irritation is of marked therapeutical value in cases of lupus vulgaris; chronic eczema; destruction of hairs growing on moles; in diseases of hair and hair-follicles, such as sycosis, tinea tonsurae, favus, where the removal of diseased hair is an essential part of treatment; in all inflammatory affections, where the purpose is to stimulate the tissues and cause absorption of inflammatory products; in certain specific affections, where destruction or absorption of tissues of low vitality is desired, and occasionally in cases of acne, lupus erythematosus, psoriasis, elephantiasis, hypertrichosis and freckles.

On the other hand, the following accidents may result from the excessive irritation from the x-ray tube; simple erythema, dermatitis of varying severity, sometimes follow by abscess and necrobiosis, alopecia, loss of nails, pigmentation and desiccation of the epidermis.

The x-rays penetrate the tissues of the body, and when applied to the lupus seem to have a selective action, because the lupus nodules will break down before the surrounding healthy tissue will and can be affected. It seems to me that the same actinic rays of the x-rays, which cause rearrangement of molecules and formation of new salts upon the photographic plate, have the same power in molecular building up of the tissue-cells and acting upon their metabolism. Heretofore the x-ray has been applied to the treatment of diseases

of the skin only, but as lupus is a tubercular affection and is curable by the x-ray, it seems to me that this therapeutical agent has to be tried also in tuberculosis of other parts. We shall see. From our records we take the following four typical cases of lupus cured by the x-ray:

Case 1.—P. S., age 34, suffering with lupus vulgaris of the face and nose for about 12 years. Ointments, cauterization, excision and transplantation twice, but the lupus would return after each treatment. The trouble was spreading at the time of consultation, and the affected parts were much infiltrated and of a deep livid color. There were many irregular partly confluent ulcers, and few nodules on the nose, upper lip much infiltrated, prolabium crusty and gums at the incisor teeth swollen. I tried the x-ray treatment, short sittings every day, beginning December 18, 1897. On January 15, 1898 a considerable improvement was noted. Healthy parts were oiled and protected with staniol. Exposures prolonged and on April 19th of the same year treatment was stopped, skin was smooth and scar tissue fine.

Case 2.—A. M., had for 6 years a lupus vulgaris on the nose. In the beginning there was an appearance of yellowish, deep papules, which gradually extended and finally appeared in the form of yellowish tubercles and apple-jelly like nodules, with abundant secretion forming crust, irregular and unhealthy ulceration. Sometimes the lupus was quite amenable to treatment, but reappeared again near the old scars. I tried at last the x-ray. Healthy tissue was protected with staniol and radiation begun with the tube removed 15 inches. After three applications of the x-ray, for 30 seconds each, nodules were diminished, same with infiltrated lymphatic glands. Later the nodules fall off and the unhealthy ulceration under prolonged radiation were changed to open and healthy granulation. This was two

than any other Scientific publication.

years ago, the patient being now completely well.

Case 3.—A. H., 28 years old, lupus vulgaris of face and nasal cavities for eight years. The affected places red with numerous nodules and crusts. Previous treatment failed. July, 1899, treatment with x-ray sittings three times a week. October 10th improved and in November treatment discontinued. Everywhere the scar tissue smooth, not very visible. No relapse.

Case 4.—L. S. lady, 30 years of age. Lupus involving the entire side of the face. I have tried the new method of treatment with short sittings—only few minutes, but daily, and the good results were obtained in ten weeks. No relapse.

I have given you only three illustrations from my own practice. The advantages which the x-ray method offers are in the way of convenience and the rapid and sure results. Practically all those cases which have been treated by this method were chronic, persistent and grave. There is no pain with this treatment, and an excellent character of the scars, which nearly approach the normal skin in appearance. And that means surely something.

THE ELECTROCHEMICAL ACTION OF THE X-RAYS IN TUBERCULOSIS.

By J. RUDIS-JICINSKY, A. M. M. D., Cedar Rapids, Ia.

Read before the Roentgen Society of the United States December 14, at the Grand Central Palace.

The early diagnosis of tuberculosis pulmonalis can be made with the help of the Roentgen rays very early. The infection usually begins at the mucous membrane of the bronchi and of the air passages, and the isolated foci of infection can be made out on x-ray examination, just as well as the haziness over the apices of the lungs. The first stage of the disease, shows marked contrast to the shadow thrown upon the fluoroscopic plate in case of consolidation. There is no question in my mind that we have to find some

way to attack and remove the cause of disease before any medication should be used. It is the seat of the disease with the operations of the causative agent—the germ—which must be attacked. The stomatic medication, serum therapy, change of climate, cataphoresis, etc., has been tried already and tuberculosis pulmonalis still remains the disease most to be dreaded.

The first attempt to apply x-rays for therapeutic purposes was made by a Freund to remove by this means the hair from a nevus. Then came the unexpected accident on account of prolonged radiation and soon it was found that the x-rays caused irritation, which had effect upon some bacteria, not of a marked electro-chemic character only, but that they were in some cases most powerful bactericide known. The successful treatment of lupus vulgaris, with the x-rays, is the best proof of it. Since 1896 I have reported few cases of lupus cured with the x-ray myself and there are many others on record abroad and in this country—Schiff, Freund, Kummell, Hoffmann, Mracek, Holland, Jones, Knox, etc.—who recommend the x-ray treatment in tuberculosis of the skin, as the latest and most successful. In my cases at least it gave satisfaction when all other methods failed.

Knowing this and thinking of the destruction of the bacilli in the living structure, with a proper immunizing of the organism against the effects of the bacilli, I have been independently experimenting for the last four years, pursuing my own way in the direction to solve a problem, so far as yet very difficult. That a cure in the first stage of consumption is not only possible, but happens very often, we know from Naegeli, and others.

With the cases of tuberculosis of the skin it seems to be fully demonstrated that the bacilli may be destroyed locally with the x-ray or that some necrosis of healthy tissues caused by raying renders the parts unsuitable for the growth of the bacilli. As lupus is a

* AMERICAN X-RAY JOURNAL, October, 1893.

*Virchow's Archiv, 1890, Cix 426.

Though we are classed amongst the Scientific

tubercular affection and is curable with the x-ray, it seems to follow that tuberculosis of other parts should respond to the same treatment if proper raying of sufficient intensity be applied. If irritation, by attracting the blood and phagocytic white corpuscles destroy the bacillus tuberculosis externally, as in lupus, why not bring the rays into the direct contact with those parts of the diseased lungs, which the fluoroscope or the skiagram shows to be tuberculous?

We know that the infecting agent of tuberculosis is the bacillus. That this disease cannot be without it, and when it exists it is invariably given off, when the disease has progressed far enough, in the form of broken-down tissue.

The first step of our experimentation was not difficult. With the help of the microscope the presence of the bacilli in the sputum was determined. A certain quantity of the sputum was placed into a fish-bladder filled up with bouillon, containing two per cent papton and six per cent glycerine, and closed, the whole being properly boxed and marked. Each box was then alternately exposed to the x-ray.

Before exposure to the x-ray I made stroke-cultures from each box named, on glycerine agar, placed the same in broad oven for ten days, at a temperature of 37° C. This preparation agitated once a day showed under the microscope a thick curled-up center around which threads were wound with the bacilli in profusion. These pure cultures with others: antrax, streptococci, staphylococci, typhus, diphtheria and gonorrhea were also alternately exposed to the x-ray and the results of these experiments showed that certain x-rays are similar in their active properties to the rays of light at the violet end of the spectrum and that various bacteria react under such radiation differently according to the quality of the plasma of the liquid they contain. With simply alkaline culture media the propagation of bacilli tuberculosis is secured and the growth of the germs accelerated by the influ-

ence of an x-ray tube, but on acid media the bacillus tuberculosis is rendered inert and may be destroyed.

Under x-ray radiation:	Media:	
	Acid	Alkaline
Bacillus antrosia, result:	Negative	Negative
Bacillus tuberculosis in sputum, destroyed in	48 minutes	Negative
Bacillus tuberculosis in flask, destroyed in	50 minutes	Growth accelerated
Pivillum cholerae, in flask, destroyed in	51 minutes	55 minutes
Bacilli of diphtheria	46 minutes	48 minutes
Bacillus of typhoid fever	45 minutes	49 minutes
Streptococcus	Negative	Negative
Staphylococcus	Negative	Negative
Micrococcus pyrogenes albus	Negative	Negative
Micrococcus gonorrhea	35 minutes	49 minutes

The third stage taken was to inoculate ten guinea-pigs and ten rabbits from above cultures. Beginning with the tenth day they were all exposed to the x-rays daily. Eight of these animals whose secretions were rendered alkaline, six guinea-pigs and two rabbits, died of tuberculosis. The others inoculated from the box with acid media having been in the first stage of tuberculosis so to say, and exposed to intense raying daily for ten seconds, were under observation living and seemingly in good condition for two years.

The bodies of the six guinea pigs and two rabbits were dissected. In all these cases we found cheesy transformation, lungs undergoing destruction with cavities. In the walls of some of the bronchioles, semi-solid granulation, tuberculous. The apices and the opposite upper lobe gave marked traces of repair, showing plenty of more or less structureless connective tissue without cheesy material. In majority of the cases we had obliteration of the pleural cavity. In two cases depositions in the brain, one in the liver and intestines. In forty per cent of the animals treated with the x-ray, and killed after elapse of two years, the post mortem examination showed that aithral ante of tuberculous process has occurred in the real sense of the word

Publications, our labor meets the practical wants of man.

when acid condition was produced. Giant-cells were not found, but chalky masses enclosed in dense tissue, connective tissue and adhesions, without the bacilli tuberculosis.

It is not necessary to demonstrate any further that the rays penetrated deeply into the tissues of all those animals treated. Every skiagraph of any part of the body is a sufficient proof of it, and the experiments, as we were able to show, gave us the opportunity to observe also the electrochemic action of the x-rays almost to their point of penetration.

The discovery of the bacillus tuberculosis was the first great step in medicine, the recognition of the fact that tuberculosis is a contagious disease, was the second. The next very good step forward, since the discovery of the ray by Professor Roentgen, is surely the very important application of the x-ray, in connection with early diagnosis of tuberculosis. Keeping in mind that very large proportion of those affected with tuberculosis may recover their health under proper treatment, or their life may be prolonged * if the diagnosis is made in time, we will find in the application of the x-ray a great help to us **. Abrams says: *** "The results of treatment in special sanatoria for pulmonary tuberculosis are marvelous. From twenty-five to forty-two per cent. of cases are cured." The diagnosis with the x-ray is not difficult. But the next step is yet to come. It is to be hoped that the step may mean the recognition of the method of cure with the unknown ray, when it becomes to be known to all of us.

Satisfied with the results of my experiments described above I have in the last two years, with patient's consent, applied the x-ray to every case of earlier stage of tuberculosis which I had, or which was sent to me for diagnosis. Nearly all these cases giving an x-ray examination: Slight laziness, indicating the beginning of tuberculous infiltration in the

apices, and the range of the excursion of the diaphragm during forced inspiration materially limited—I have treated accordingly, attacking the seat of the disease, forgetting not the three most important factors—pure air, the temperature and good hygienic surroundings. From twenty selected cases in one year one died with intestinal complication, tubercular, another committed suicide after two sittings, and the rest is doing comparatively well, only four being a complete failure. Exposure varied with each case from ten minutes to fifteen per sitting. The rays have to be observed with the fluoroscope at each exposure, the tube tested to see that it was working at its best, and the apparatus must be under full control of the expert, who with the help of the x-ray will not only determine what portion of the tissues are diseased, but locates also the area over which the disease extends and what changes have taken place since the first exposure. The treatment ceases with favorable condition of the patient, and when the lungs give us reports—the plate of the fluoroscope an image of shadows of new formed adhesions—which are opaque to the x-ray—in a transparent field of healthy tissues or when the range of excursion of the diaphragm is increased.

The patient is seated in a chair without a back, the Crook's tube held about 15 to 18 inches from the body, directly in line with the diseased spot, showed on the screen of the fluoroscope in front, which must be applied firmly and to the bare chest if necessary. At the next sitting the procedure is repeated, the Crook's tube being in front. The proper distance between the light and the screen is about 30 inches, but this depends altogether upon the character of each given case and may be gradually extended or diminished.

It is very difficult to find just the length of exposure to make in these cases. If you do not

*Underøyveler om Lungentuberculoseus Hyppighed og Helbrudlighed, Christiania, 1893, Jens Bugge.

**New York Medical Journal, February 18, 1899.

***Philadelphia Monthly Medical Journal, March 1899.

*Walsh: During quite breathing in a healthy lung the excursion of the diaphragm, as registered by the liver, is about one-half inch; during forced inspiration from 2 to 3 inches, little more on the right than left.

Since diagnosis is the foundation of all practice the

expose long enough and at regular intervals, the desired result is not obtained; and if we expose too long, we may set up an inflammation which may cause hemorrhage from the irritated lung tissue and weakened vessels and accelerate the growth of the bacilli, instead to destroy them. In other words, the diseased tissue of the lungs is of such low vitality that the influence of the x-rays may cause its absorption or even distinction before having any marked effect upon the healthy tissue. The x-ray seems to have a selective power in these cases, just as well as in tuberculosis of the skin. While removal of the bacilli or better to-day of the cause is essential to permanent cure, it is well—I am speaking of earlier stages only—in order to retain the patient, to institute some measure to support the untrifling changes in the healthy part of the lung tissue with increased metabolic change, stimulating more rapid and complete oxidation of the blood, and nothing has answered so well in my cases as the static electricity which may be used alternately with the x-ray. Such static electrization tones up the patient for the next x-ray exposure and with all the other hygienic and therapeutic measures necessary according to the symptoms, will give the nature an opportunity to deposit healthy lung tissue and the repair may take place. The great function of the x-ray in our cases with the results so far obtained being very encouraging, would be to destroy the bacilli directly in the lungs and the franklinization is to improve and restore untrifling not only of a part but the whole.* By such process of treatment the healthy tissue is kept immunized on one side and on the other the further proliferation of the bacilli stopped. The majority of our patients improved, the bacilli disappeared from their sputum, the night-sweats ceased and now the patients do not cough and say that they feel good and are restored to usefulness. But I would not like to state that the cases were cured by the x-ray exposure only, for it may

have been spontaneous cure in all of them, but they are certainly now well, and are feeling good and also just as certainly had tuberculosis, when our treatment began.

As to the danger accompanying the use of the x-rays, I have to state and can prove it from my experimental work, that there is absolutely none, when proper care is taken. During the actual daily applications of these rays to my patients for diagnostic and therapeutic purposes I did not have one case of dermatitis or necrobiosis of my own,* and if we take certain precautions, use proper apparatus and do not prolong our exposure unnecessarily, the rays will be avoided. At the first trace of slight burning sensation, itching or trace of brownish coloration of the skin, the treatment must be stopped at once. It must be certainly employed systematically to secure some results, because the x-ray may act not as a stimulant as desired, but as an irritant, giving us all the inflammatory phenomena not only at the focus of irritation, but spread perhaps over a large contiguous surface with changes, directly dependent upon the disturbances of the circulation. It is clearly apparent that the x-ray in sufficiently form is made to reach the tubercle bacilli in the living tissues, its destruction may follow, and it remains for us to demonstrate this fact not only theoretically, but clinically. The employment of the x-ray in cases of phthisis pulmonalis is worthy of extended trial.

This is a practical question which, with practical tests, will show us, if we have finally found the weapon against the baneful blight, and can put an end to the spread of the terrible and deadly contagion.

Let us have a number of establishments, where this experimental work would flourish, sanitarium, public and private, which would do a world of good by curing the curable tuberculous cases, and taking care of the hopeless ones, thus diminishing countless centers of infection.

* International Congress of Medical Electrology, Radiology, Paris, 1900. D. A. Tripler: "Franklinisation."

* "New York Medical Journal," March 17, 1900. By the author

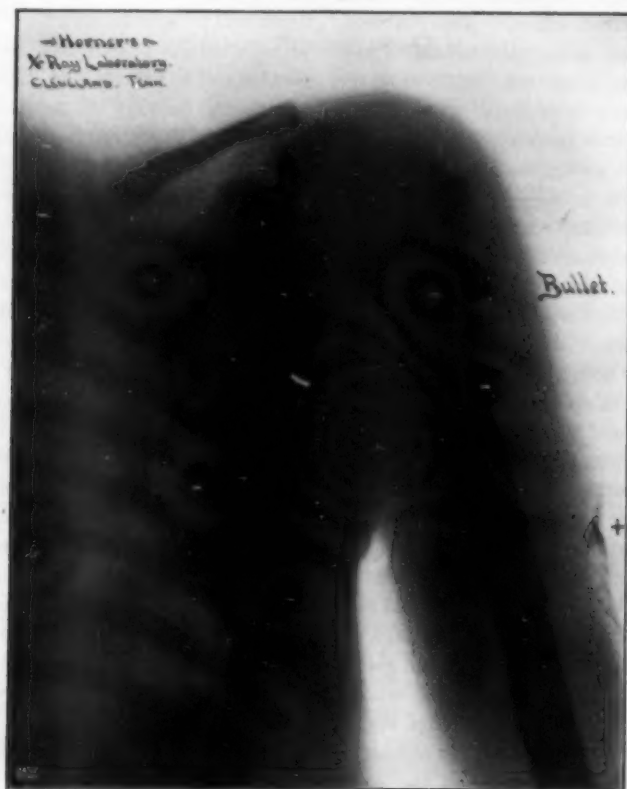
The skiagraph made by Prof. W. O. Horner, of Cleveland, Penn., herewith shown, is a clear reminder of the diagnostic value of the x-rays. The germ carrying probe had been used in vain to locate the bullet and the patient necessarily subjected to danger by this old time procedure.

The arm shows the point of entrance of the bullet very clearly. Some stain of lead

opposite the point of entrance marked with x but not injured. The ball ranged upwards and was spent at the surgical neck of the humerus as seen in the skiagraph.

EDITOR AMERICAN X RAY JOURNAL:

Dear Sir: In the November number of your journal, Dr. Carl Beck, of New York, suggests that the Roentgen Society of the United States, standardize a different word



was probably left at this point since the skin is tense and offers greater resistance than other soft structures. The bullet is a 38 calibre and passed through a board $1\frac{1}{4}$ inches thick and was fired for the purpose of scaring some boys. It struck the right arm of this innocent lad while celebrating Hollow'en. The bone was struck nearly

than "Radiograph," and offers "Skiagraph" as a substitute.

The doctor has overlooked the fact, that he has proposed a series of words that have been, and are used to designate things entirely different, for instance, Skiagrapher, Skiagraphy and Skiagraph have long been in use and refer to the maker,

Hope of reward is an inherent attribute and the

Ame

making, and the finished drawing of the vertical section of a building, showing its interior arrangement. The word "Sciascopy" however, has been adopted by the ophthalmologists to describe a method of examining the retina. The Century Dictionary says that this word is used to designate "the method of estimating the refraction of an eye by throwing into it light from an ophthalmoscopic mirror, and observing the movements which the retinal illumination makes on slightly rotating the mirror." This definition certainly describes something entirely different from what Dr. Beck proposes, and as the word was evidently coined to describe this particular test, and has been used quite extensively by medical writers both in this country and abroad, and in addition to this has been incorporated in several modern dictionaries, there would seem to be no excuse for appropriating it, or any of the words quoted above.

Hybrid words may not be considered "Classic" but they are already so numerous, that the permanent addition of one or two more would hardly seem a matter of much importance.

Very Truly Yours,
MARTIN I. WILBERT,
Care German Hospital,
Philadelphia.

SKIAGRAPHS.

Dr. Mihran K. Kassabian of Philadelphia, Pa., during the first regular meeting of the *Röntgen Society of the United States* (Dec. 13th and 14th, 1900), which was held in Grand Central Palace, New York, exhibited the following skiagraphs numbering more than 150 different actual surgical and medical cases.

(1) *Lung cases* (Tubercular 16x20), including every stage of tuberculosis, viz. infiltration, consolidation, both apices, cavities miliary tuberculosis, pleurisy with

effusions, lobar pneumonia, and abscess.

(2) *Eye cases*, viz., foreign bodies, as a small piece of steel, glass and shot, etc.

Silver canulae in both lacremal ducts (profile and occipito-frontal views), gold and glass balls and artificial eyes (after the implantation and *Mile's* operation).

(3) *Foreign bodies*, as shots, needles, pins, glass, etc. Shot in the antrum, showing the course of it.

(4) *The Kidneys* injected with two different kinds of opaque material, bismuth and plaster of Paris. The veins were injected with the bismuth and the arteries with plaster of Paris, which gave different shadows in the arterial and venous blood supplies of the organ. This is an interesting study from a histological and physiological standpoint.

(5) *Vesical and Renal Calculi*. 12 year old boy congenital *imperforated anus*. Bismuth emulsion was injected through a rubber tube passing into the artificial anus. X-ray shows the size of the pouch and the distance from the lower portion of the rectum (a steel sound was passed into the sphincter ani operated and pouch was pulled down and anastomosis made, by excising the coccyx).

(7) *Fractures*. (a) *Upper extremities*, viz.; phalanges, meta-carpal bones, *Colles*; twenty different varieties. Barton's, and middle and upper third of radius and ulna (some of them were medico-legal cases). Olecranon process of ulna; supra-condyloid, separation of epicondyles, inner-condyles, surgical and anatomical neck of humerus, clavical, scapula spinous process and glenoid cavity.

(b) *Lower extremities*. Phalanges, Metatarsal bones; *Pott's*, more than twenty different varieties, viz., longitudinal transverse and oblique of tibia and fibula; patella, several pieces; supra-condyloid or femur, middle of the Femur; Intra extra capsular of the femur.

(8) *Head*. Ramus of the inferior max-

illary; fracture of the inner table of the skull (medico-legal case); cervical vertebra.

(9) *Dislocations.* Hip joint; fracture and lateral dislocation of the twelfth dorsal vertebra; wrist; elbow; shoulder; ankle; knee and hip.

(10) Several pathological cases, as osteitis, necrosis, and osteo-myelitis, arthritis, and Charcot's joint; and gouty deposits; floating cartilage in knee joint.

Also negatives were on exhibition.

PHOTOTHERAPY IN SURGERY.

BY DR. A. V. MININE.

[Translated from *Revue Internationale d' Electrotherapie et de Radiotherapie* by Dr. Frank Ring for American X-Ray Journal.]

The author gives a short review of the history of phototherapy, calling attention to its use by the Greeks and Romans, and mentioning Alsus, Galen and Avisenna among its advocates. In antiquity it was used for the treatment of leprosy.

M. Niels R. Finsen, who employs the method of treatment by electric light and concentrated sunlight, is of the opinion that the curative effect of the light must be attributed to chemical rays; he excludes totally the influence of heat-rays in the treatment of lupus.

Since the month of February, 1899, the author has used an incandescent lamp of fifty candle power, provided with a reflector. He maintains the lamp, near to the affected part, but at a distance sufficient for the patient to appreciate only a slight sensation of heat. The seances are repeated on successive days, or every two days, and each seance lasts from ten to fifteen minutes. The succeeding seances may even be prolonged to twenty or twenty-five minutes, but it will then be necessary to use light massage to the part exposed to the electric rays.

A lamp of less force may be used.

The application of electric light as a means of cure has, perhaps, more importance in surgery than in internal medicine. Attention is called to the anæsthesia which may be produced by its use, within a few minutes the anæsthetic force of electric light is very considerable; all the pains occasioned by pleurisy, articular rheumatism, contusions and inflammations of the skin may be ameliorated by its application. It is true that the neuralgias are an exception. It exercises a resorbant power in subcutaneous hemorrhages and exudations.

ADVICE TO RAILROAD CORPORATIONS.

THE AMERICAN X-RAY JOURNAL has persistently urged railroad corporations to provide their surgeons with x-ray apparatus, together with accessories, for the purpose, at least, of avoiding error that is so much used against the company and their doctors. Skiagraphs taken soon as possible after the accident, and again after dressing, and again when the patient is discharged from the care of the company, leaves the record complete. All the language of a sophist or the paraphrase of the skilled council can not bear down the simple argument the truth these pictures make. This method also, is the only just solution of contention between employer and employed. With the facts before each party to the case, clear and unmistakable to both, is it not reasonable to think that litigation would diminish and enmity vanish?

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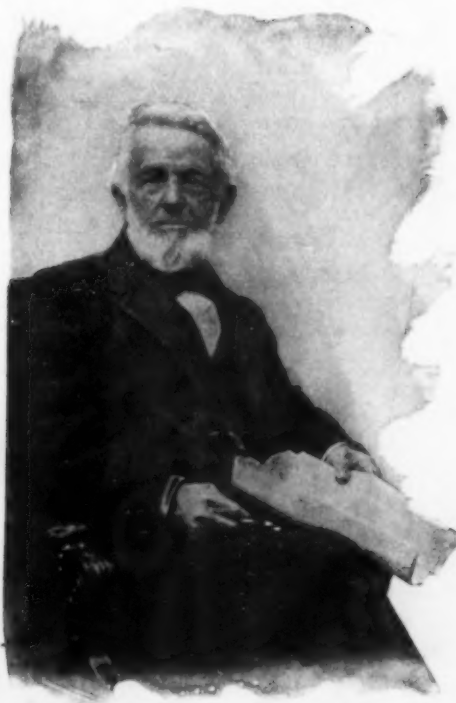
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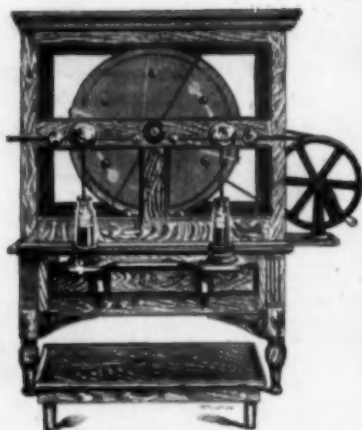
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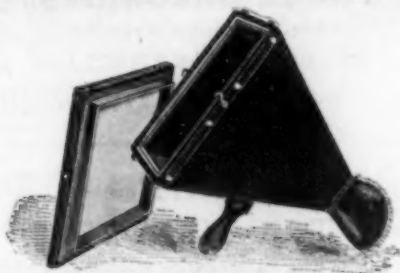
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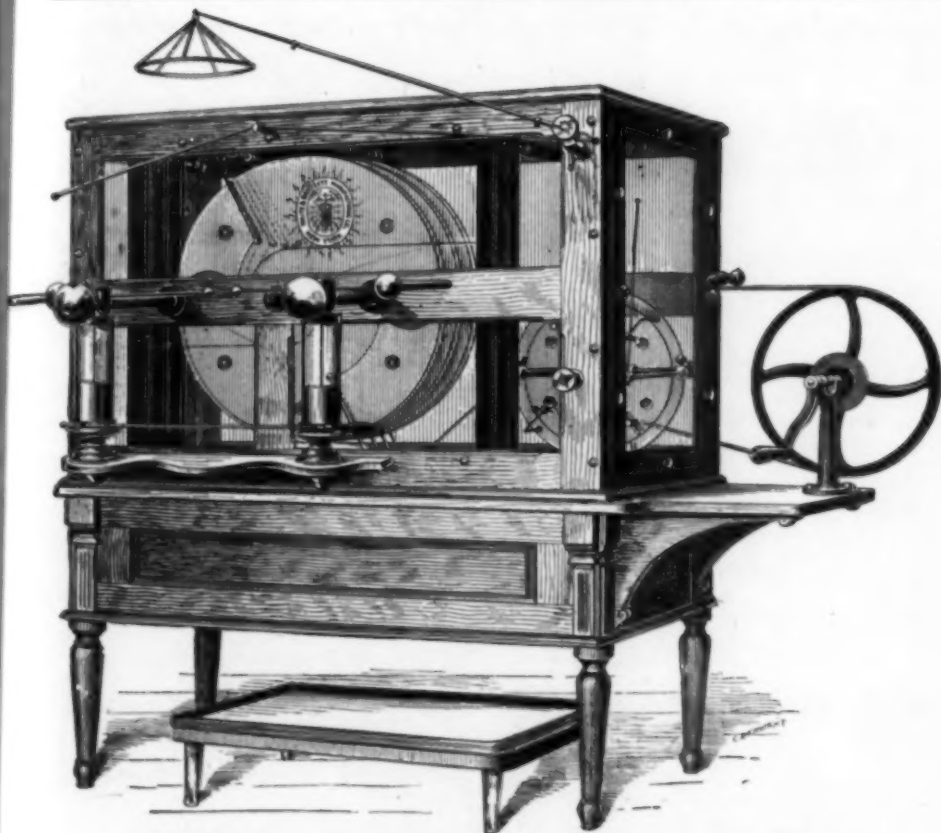
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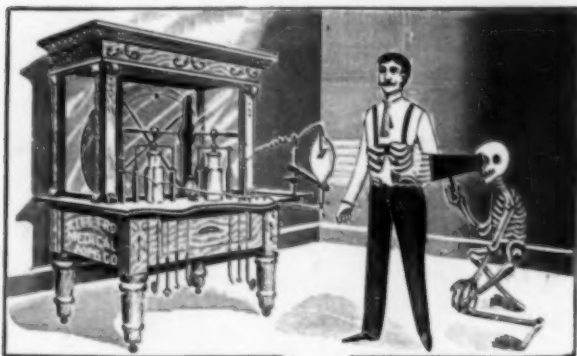
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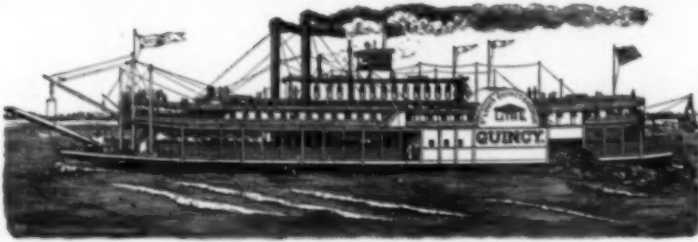
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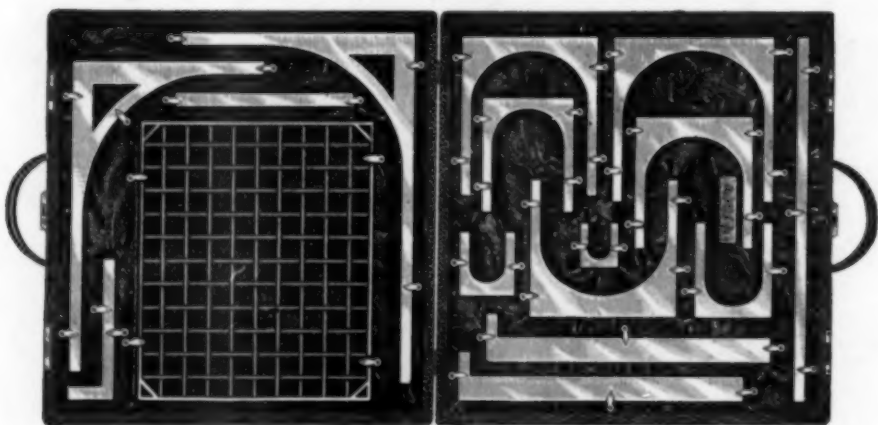
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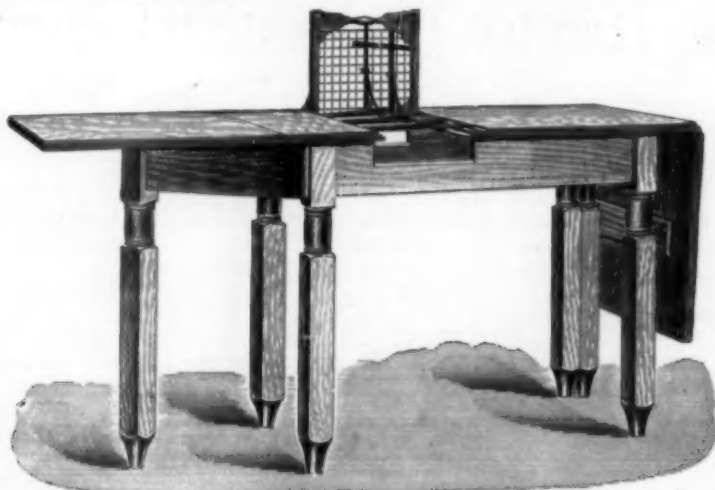
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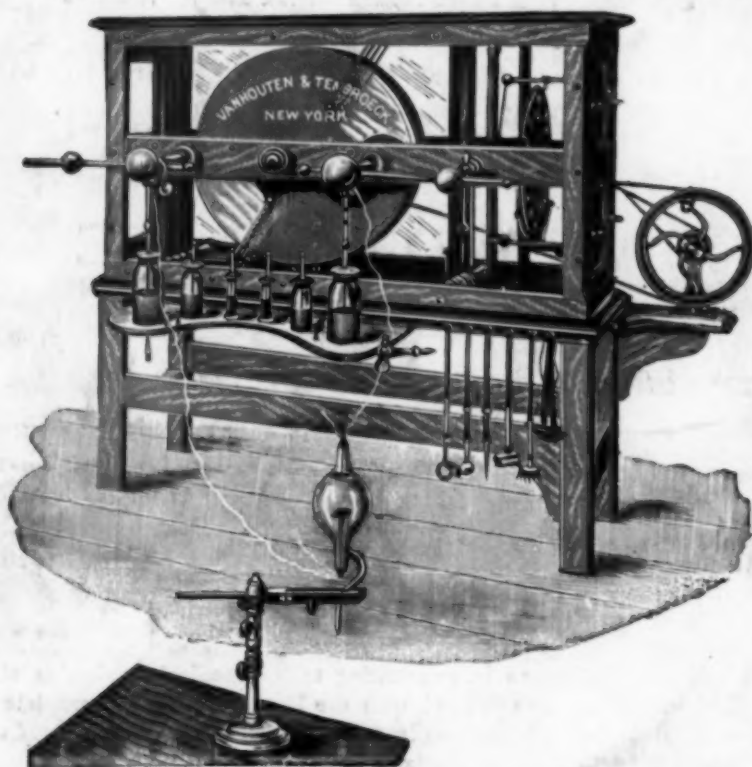
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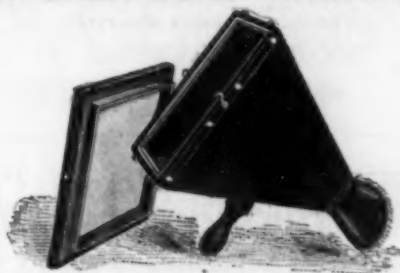
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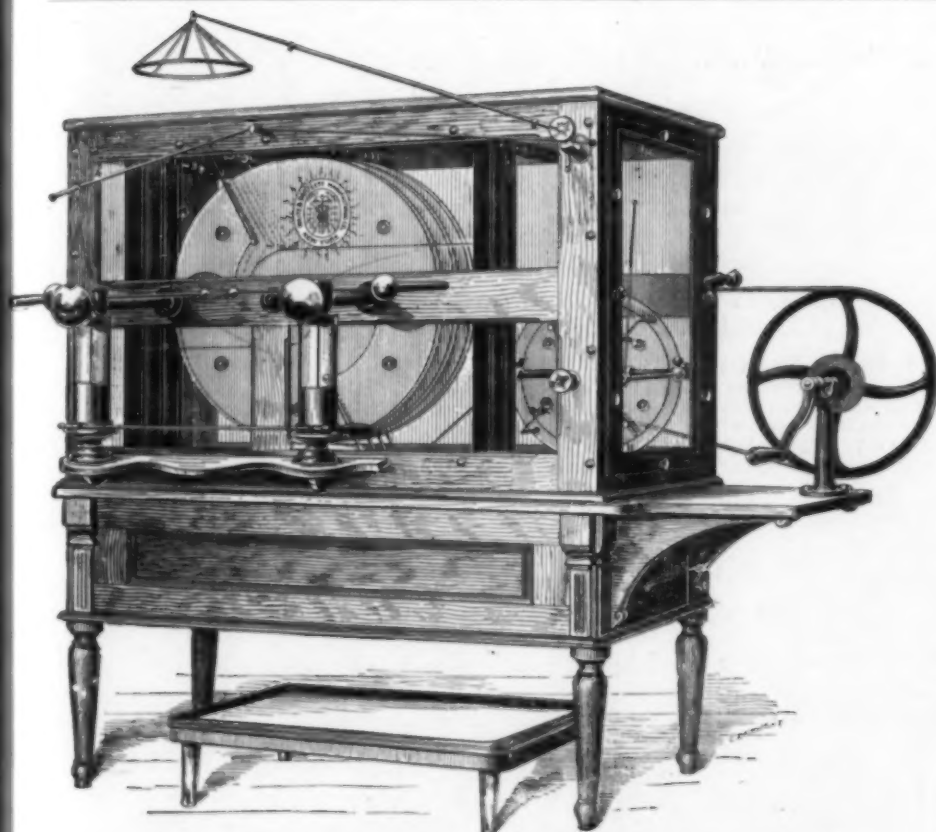
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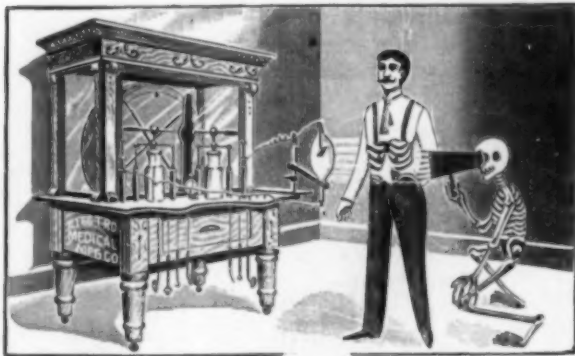
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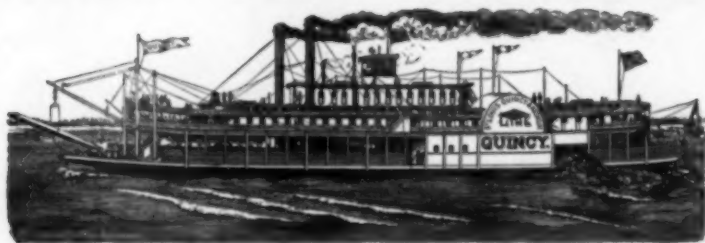
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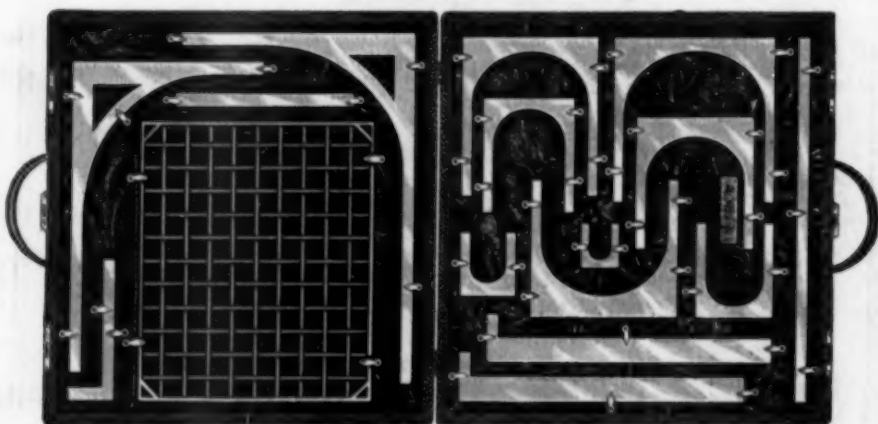
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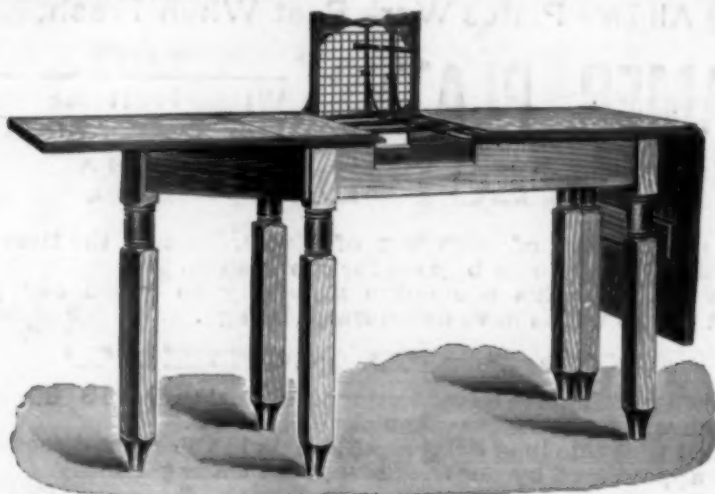
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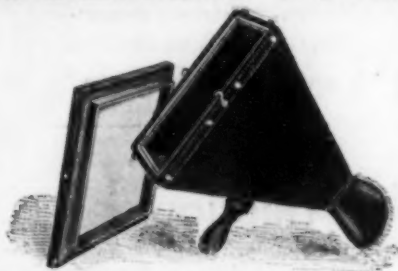


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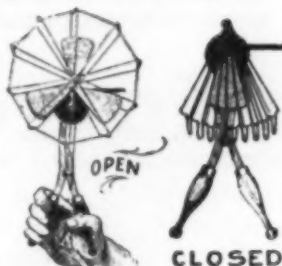
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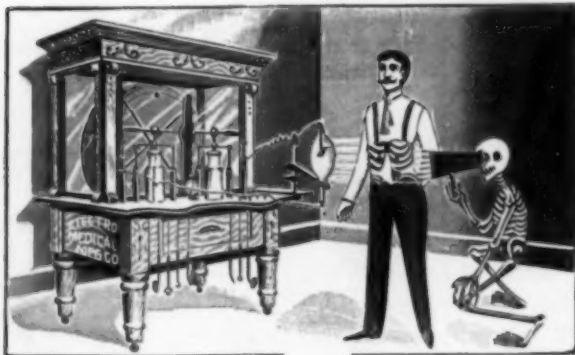


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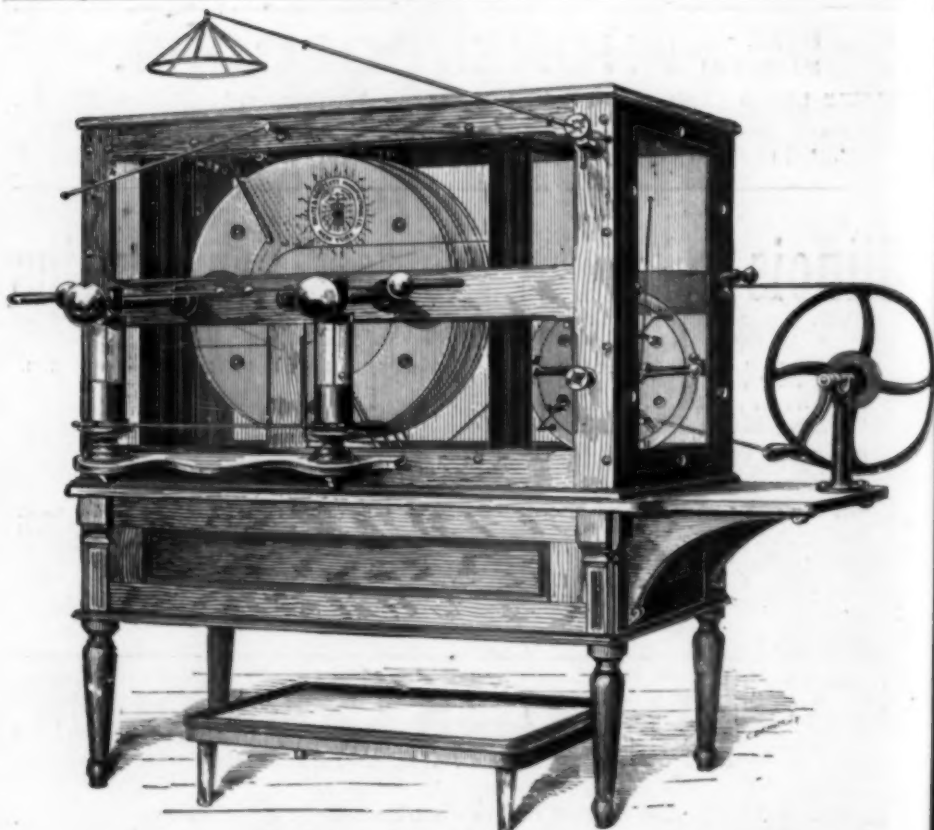
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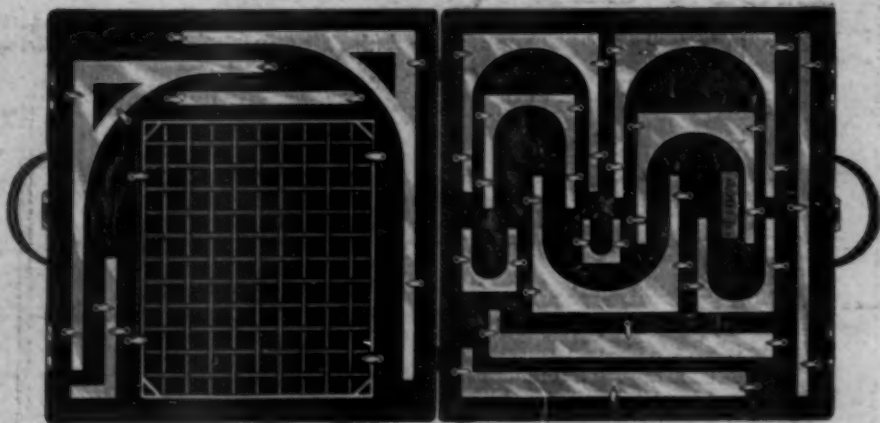
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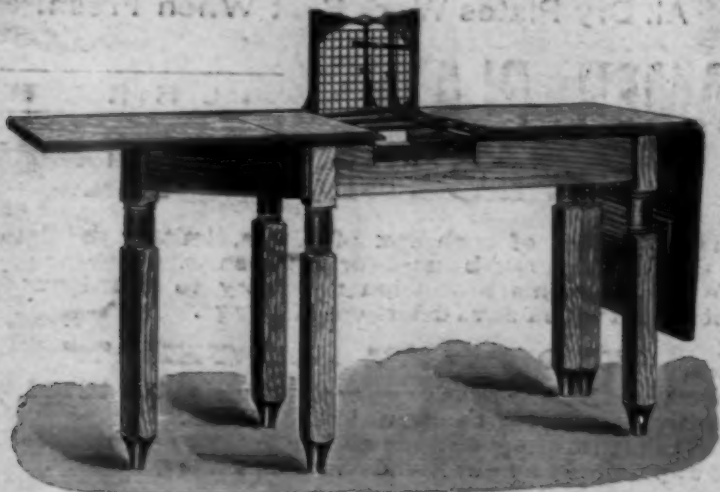
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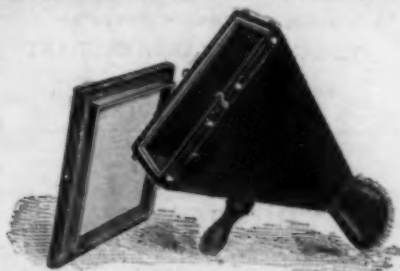
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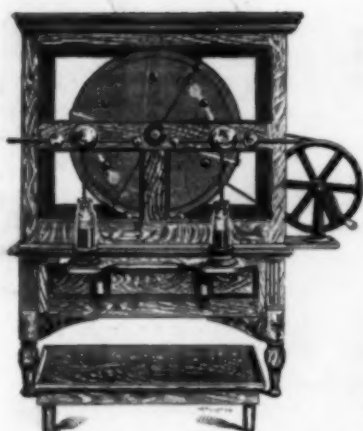
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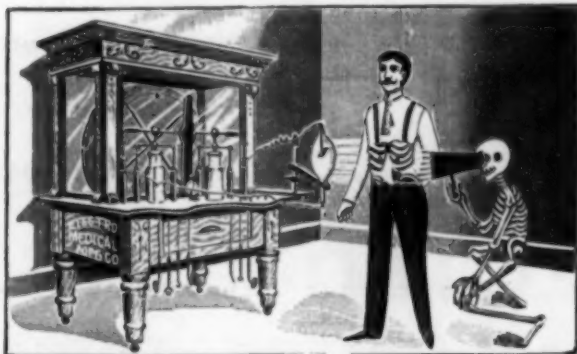


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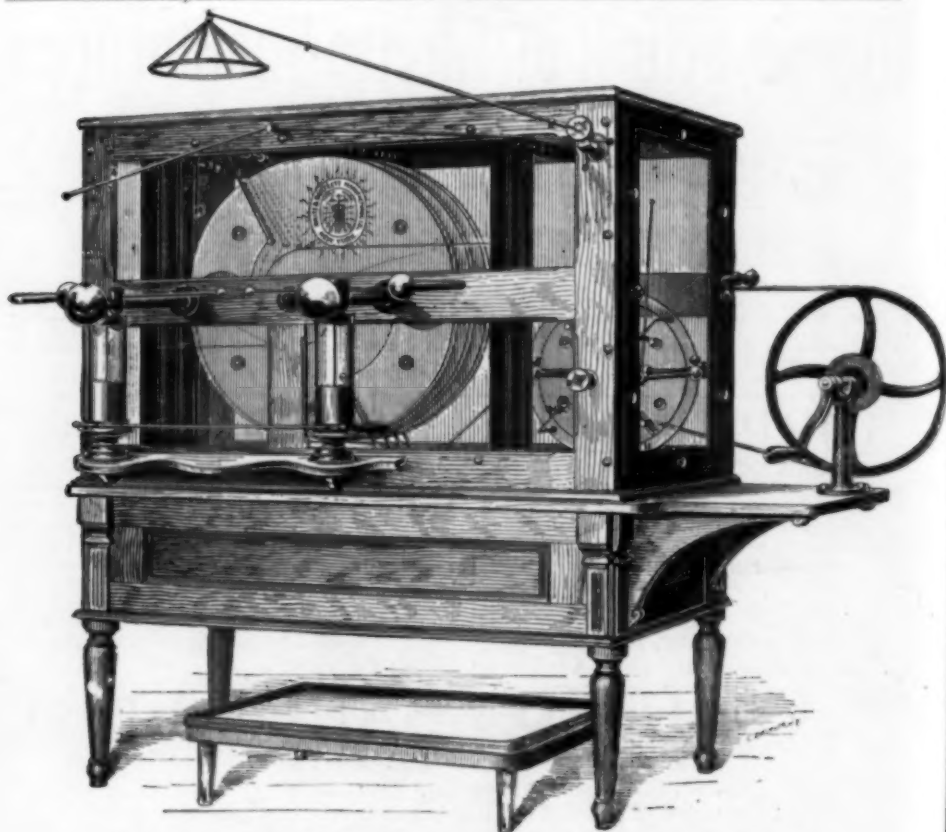
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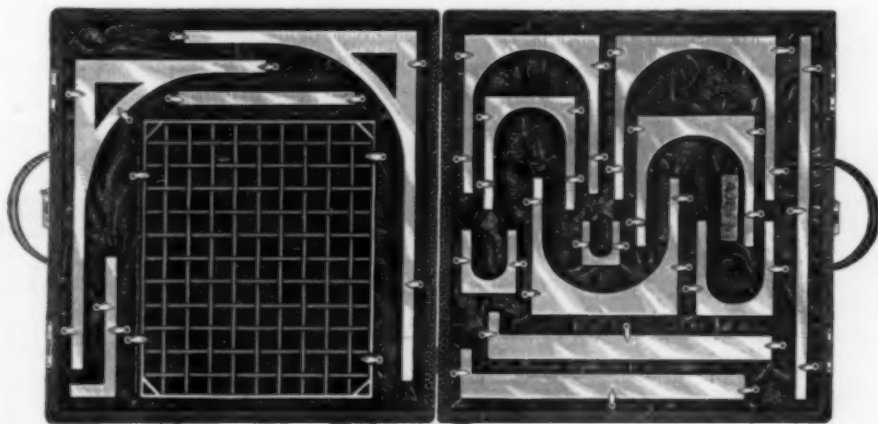
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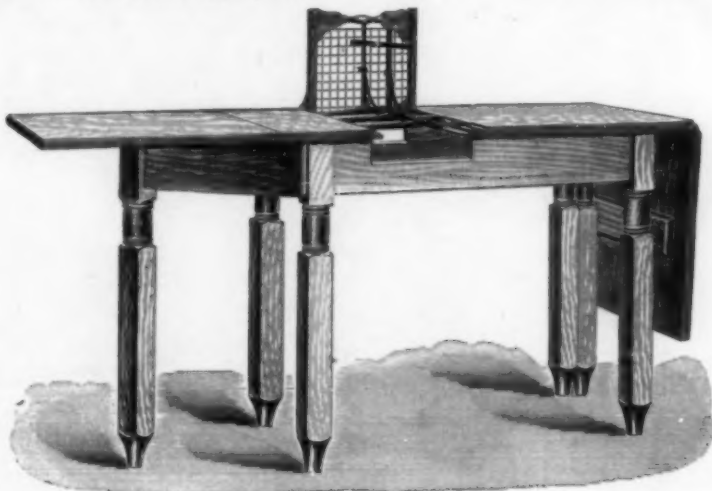
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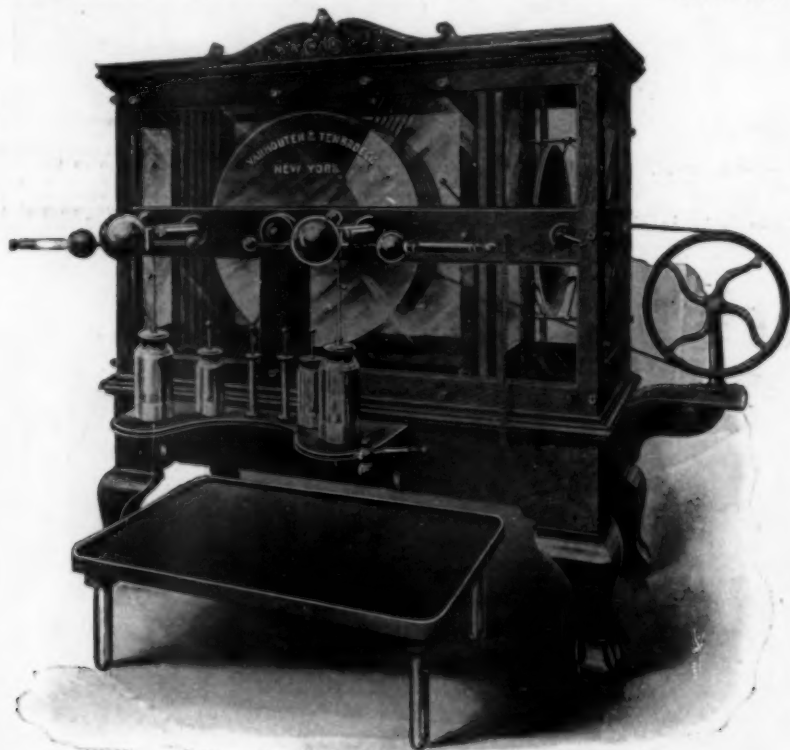
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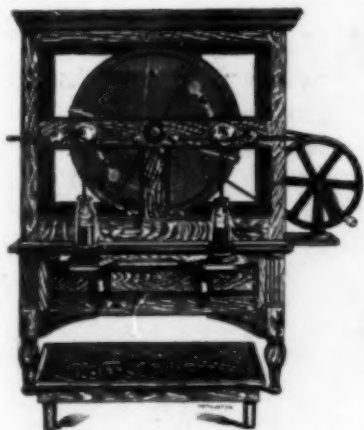
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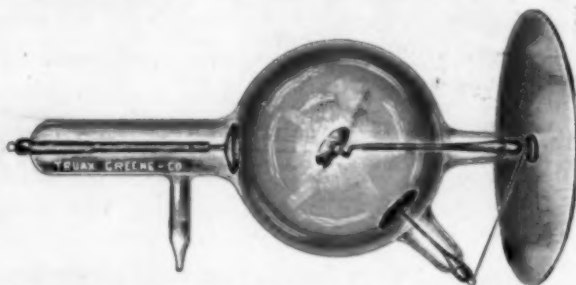
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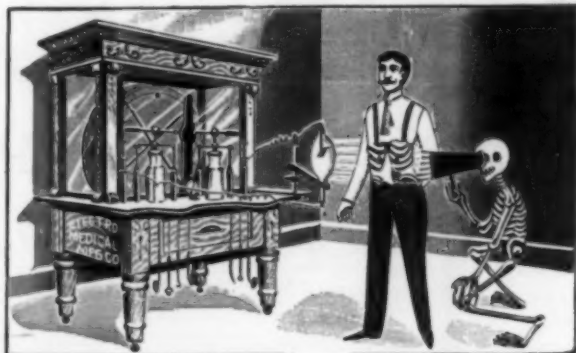


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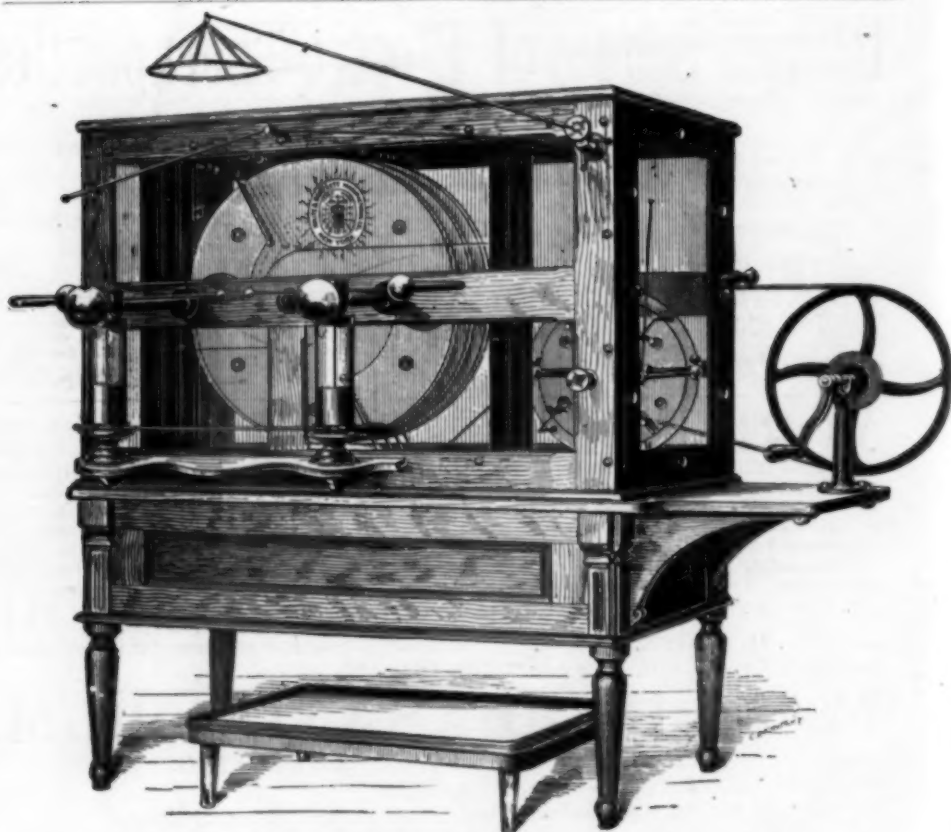
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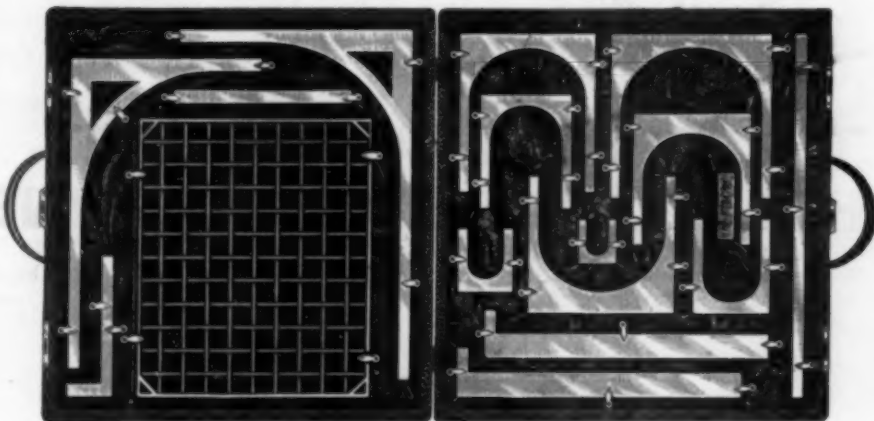
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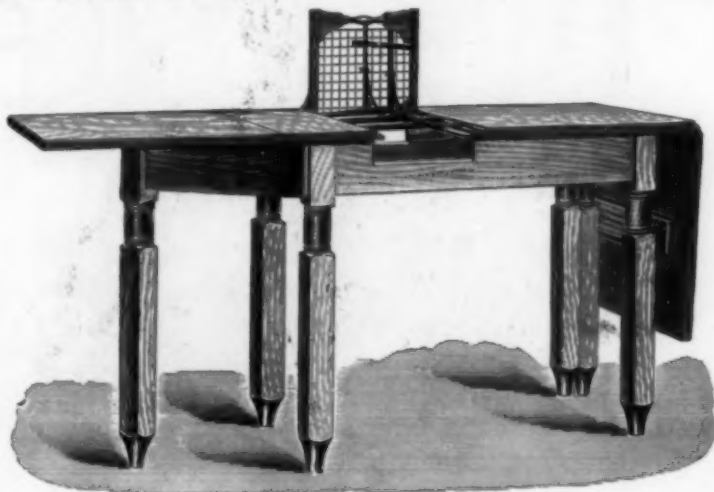
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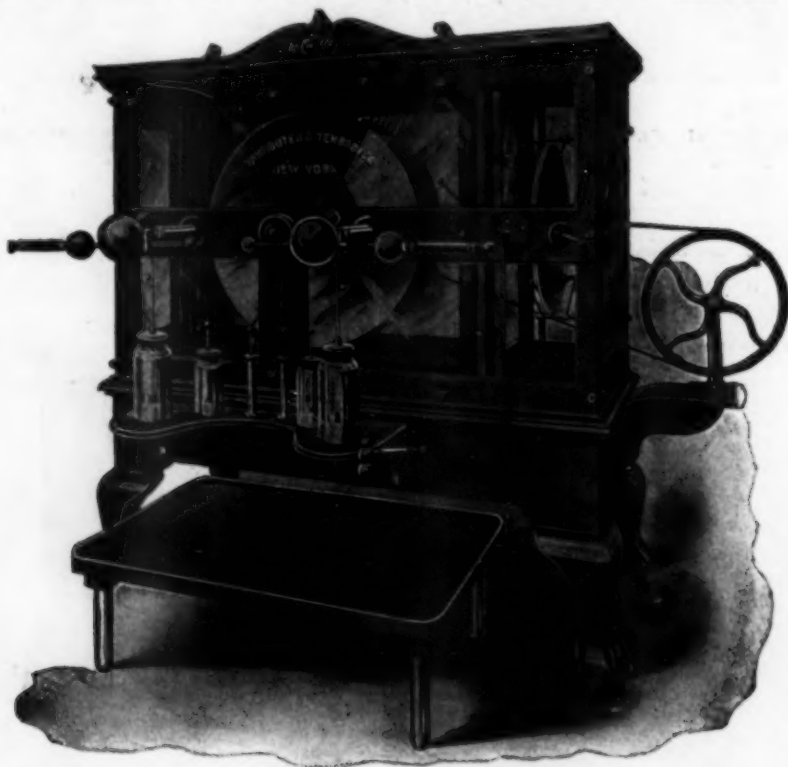
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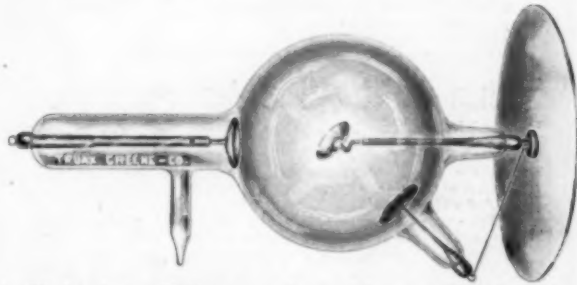


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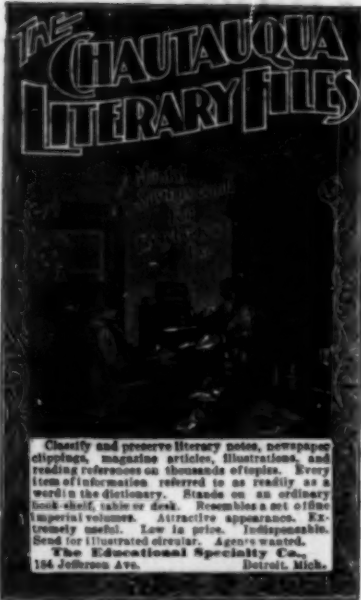
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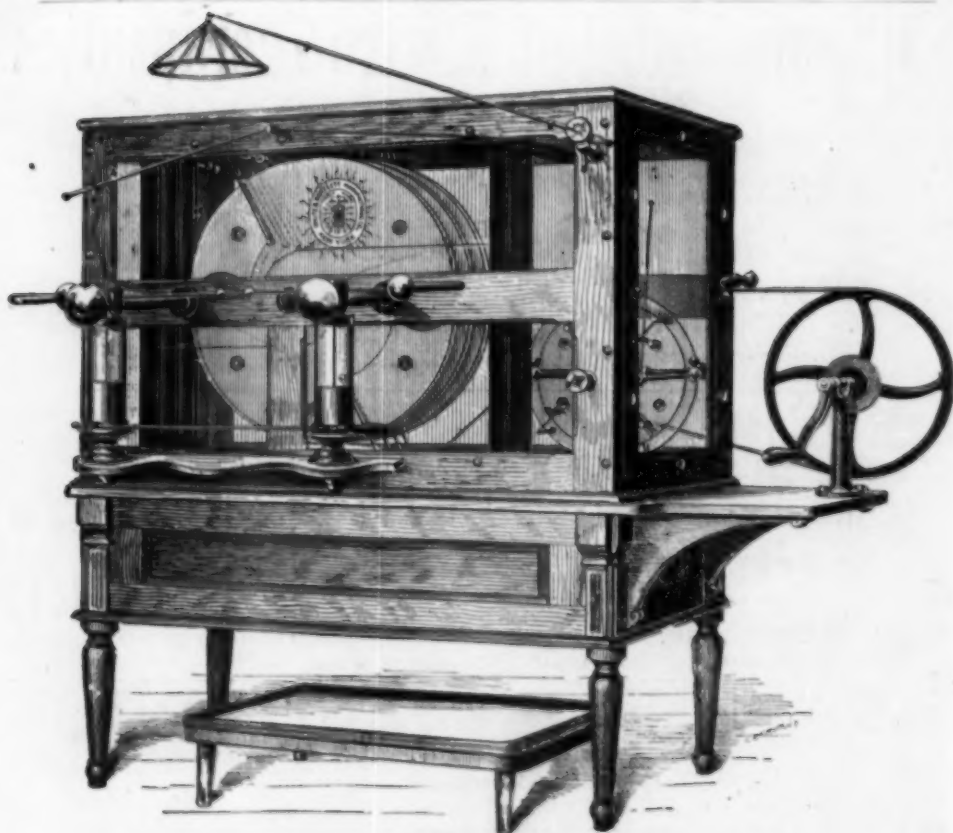
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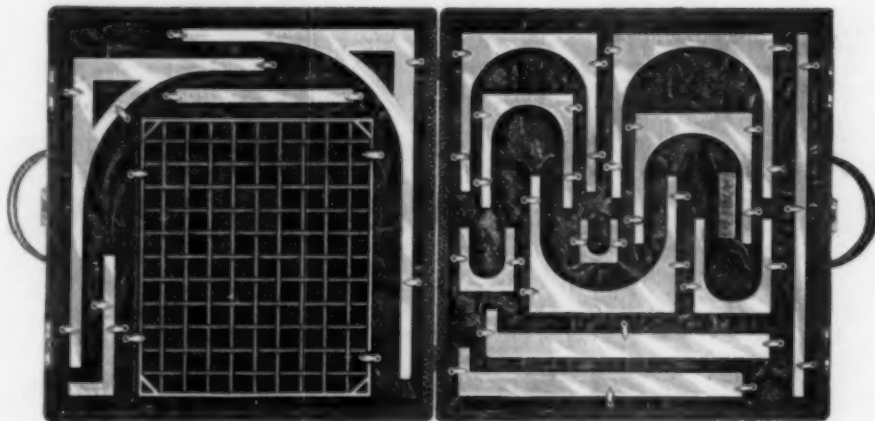
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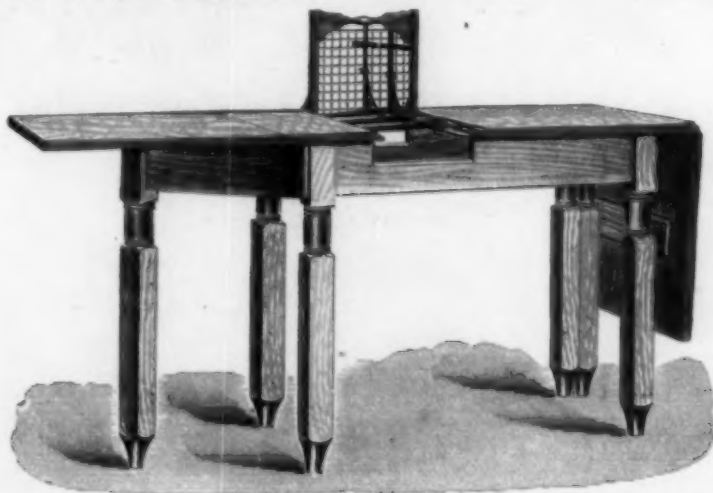
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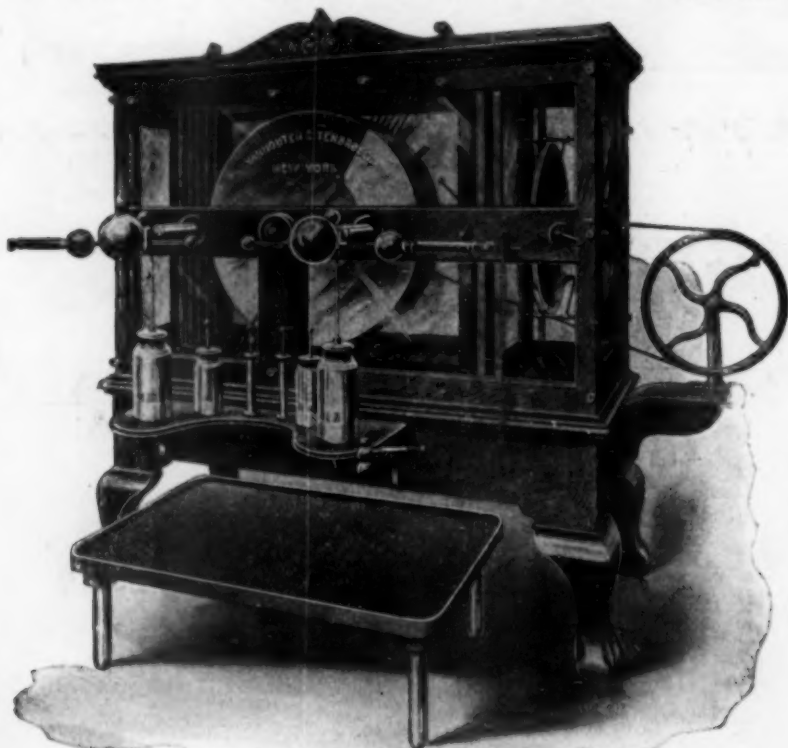
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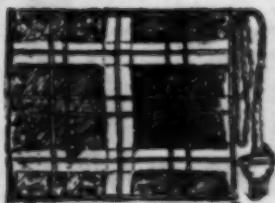
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